

## FULLERENES

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A fullerene is any molecule composed entirely of carbon, in the form of a hollow sphere, ellipsoid or tube. Spherical fullerenes are also called buckyballs. Fullerenes are similar in structure to graphite.

The first fullerene molecule was prepared in 1985 by Richard Smalley, Robert Curl, James Heath, Sean O'Brien, and Harold Kroto at Rice University. The name was homage to Buckminster Fuller, whose geodesic domes it resembles.

The discovery of fullerenes greatly expanded the number of known carbon allotropes, which until recently were limited to graphite, diamond, and amorphous carbon such as soot and charcoal. Fullerenes have been the subject of intense research, both for their unique chemistry and technological applications. Types of fullerene are: fullerenes with different numbers of carbon molecules ( $C_n$ ); nanotubes (hollow tubes of very small dimensions, having single or multiple walls); megatubes (chain, two-dimensional and three-dimensional polymers are formed under high-pressure high-temperature conditions); nano"onions" (spherical particles based on multiple carbon layers surrounding a buckyball core); linked "ball-and-chain" dimers (two buckyballs linked by a carbon chain); fullerene rings; fullerite (solid-state manifestation of fullerenes and related compounds and materials).

Applications of fullerenes: the basis for the production of batteries; to create photodetectors; additives for artificial diamonds; additives in motor oil; in medicine and pharmacology as well.

Pharmacologists use fullerene balls to deliver variety of substances into the cell and place them on the surface of cell membranes. Fullerenes are not toxic, do not suppress normal cells. They are the most powerful ever known antioxidants. Being dissolved in water all the healing properties of fullerenes increase sharply.

At present the researches are on the way of using fullerenes to prevent the spreading of cancer cells.

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